

IN THE CLAIMS:

The following is a complete listing of the claims in this application, reflects all changes previously made to the claims, and replaces all earlier versions and all earlier listings of the claims:

1.-9. (Canceled)

10. (Previously Presented) A laser comprising:

a first region with a first waveguide, said first waveguide including a first diffraction grating;

a second region with a second waveguide, said second waveguide including a second diffraction grating; and

a phase controlling region with a third waveguide, said phase controlling region including control means for controlling an effective refractive index of said third waveguide, wherein said phase controlling region, said second region, and said first region are serially coupled in this order, and are constructed such that a coupling coefficient of said second region adjacent to said phase controlling region is smaller than a coupling coefficient of said first region, and said first and second diffraction gratings have a common value of pitch.

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11. (Previously Presented) A laser according to claim 10, said phase controlling region, said first region, and said second region being constructed such that light to said second region from said phase controlling region is enlarged relatively to light to said phase controlling region from said second region.

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12. (Previously Presented) A laser according to claim 10, said second region further including control means for pumping said second region, and said phase control means and said control means of said second region being capable of independently controlling said phase controlling region and said second region, respectively.

13. (Previously Presented) A laser according to claim 12, said phase control means and said control means of said second region being capable of independently injecting currents into said phase controlling region and said second region, respectively.

14. (Previously Presented) A laser according to claim 10, said first region further including first control means for pumping said first region, said second region further including second control means for pumping said second region, and said first control means and said second control means being constructed such that a pumping amount of said second region can be smaller than a pumping amount of said first region.

15. (Original) A laser according to claim 10, said laser being constructed as a distributed feedback semiconductor laser.

16. (Original) A laser according to claim 15, said phase controlling region further including a cleaved end facet.

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17. (Original) A laser according to claim 16, a reflective layer being provided on said cleaved end facet.

18. (Previously Presented) A laser according to claim 15, said first region further including an antireflection layer provided on a cleaved end facet of said first region.

19. (Previously Presented) A method for driving a laser, said method comprising the steps of:

(A) preparing a laser including:

(1) a first region with a first waveguide, said first waveguide including a first diffraction grating;

(2) a second region with a second waveguide, said second waveguide including a second diffraction grating; and

(3) a phase controlling region with a third waveguide, said phase controlling region including control means for controlling an effective refractive index of said third waveguide, wherein said phase controlling region, said second region, and said first region are serially coupled in this order, and are constructed such that a coupling coefficient of the diffraction grating of said second region adjacent to said phase controlling region is smaller than a coupling coefficient of the diffraction grating of said first region, and said first and second diffraction gratings have a common value of pitch; and

(B) changing a current injected into or a reverse voltage applied to the phase controlling region to change at least one of a polarization mode and a wavelength of light output from the laser.

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20. (Previously Presented) A light transmitter comprising:

(A) a laser including:

(1) a first region with a first waveguide, said first waveguide including a first diffraction grating;

(2) a second region with a second waveguide, said second waveguide including a second diffraction grating; and

(3) a phase controlling region with a third waveguide, said phase controlling region including control means for controlling an effective refractive index of said third waveguide, wherein said phase controlling region, said second region, and said first region are serially coupled in this order, and are constructed such that a coupling coefficient of the diffraction grating of said second region adjacent to said phase controlling region is smaller than a coupling coefficient of the diffraction grating of said first region, and said first and second diffraction gratings have a common value of pitch;

(B) control means for controlling light output from said laser in accordance with a transmission signal; and

(C) a mode selector for selecting a component of a desired mode from the light output from said laser.

21. (Original) A light transmitter according to claim 20, said mode selector comprising a polarization-mode selector.

22. (Original) A light transmitter according to claim 20, said mode selector comprising a wavelength selector.

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23. (Previously Presented) An optical communication system for communicating over a light transmission line that transmits a signal from a transmitter side to a receiver side, said system comprising:

(A) a light transmitter for transmitting light of a signal through the light transmission line including:

(1) a laser including:

(a) a first region with a first waveguide, said first waveguide including a first diffraction grating;

(b) a second region with a second waveguide, said second waveguide including a second diffraction grating; and

(c) a phase controlling region with a third waveguide, said phase controlling region including control means for controlling an effective refractive index of said third waveguide, wherein said phase controlling region, said second region, and said first region are serially coupled in this order, and are constructed such that a coupling coefficient of the diffraction grating of said second region adjacent to said phase controlling region is smaller than a coupling coefficient of the diffraction grating of said first region, and said first and second diffraction gratings have a common value of pitch;

(2) control means for controlling light output from said laser in accordance with a transmission signal; and

(3) a mode selector for selecting a component of a desired mode from the light output from said laser; and

(B) a receiver for receiving and detecting an intensity-modulated signal transmitted from the laser through the light transmission line.

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24. (Original) An optical communication system according to claim 23, said system being a wavelength division multiplexing optical communication system, in which the light transmission line transmits a plurality of intensity-modulated signals at a plurality of wavelengths generated by a plurality of said transmitters, and a wavelength selector selects the intensity-modulated signal at a desired wavelength to be detected on a side of said receiver.

25. (Previously Presented) A laser according to claim 10, wherein said phase controlling region includes a reflective layer.